Contents

Preface v

1. CHEMICALLY DRIVEN SOLID STATE AMORPHIZING TRANSFORMATIONS

Remarks on solid state amorphizing transformations 1
R. B. Schwarz (Los Alamos, NM, U.S.A.) and W. L. Johnson (Pasadena, CA, U.S.A.)

Crystallization of zirconium-based metallic glasses 7
U. Köster and M. Blank-Bewersdorff (Dortmund, F.R.G.)

Amorphization of Zr–Fe multilayers observed by *in situ* X-ray and magnetization measurements 17
H. U. Krebs (Göttingen, F.R.G., and Stanford, CA, U.S.A.), D. J. Webb and A. F. Marshall (Stanford, CA, U.S.A.)

Early and late stages of solid state amorphization reactions 25
K. Samwer (Göttingen, F.R.G.)

Low-angle X-ray diffraction study of solid state amorphization in an Ni/Ti multilayer 33
M. A. Hollanders and B. J. Thijsse (Delft, The Netherlands)

Amorphization by solid state diffusion in granular system 49
E. Gaffet, J. C. Anglezio, J. Bigot and G. Martin (Vitry-sur-Seine, France)

Structure of early transition metal–late transition metal multilayers 57
B. M. Clemens (Warren, MI, U.S.A.)

Bulk property measurements for studying solid state reactions 67
C. Brouder, G. Krill and M. Piécuch (Vandoeuvre-lès-Nancy, France)

2. MECHANICALLY DRIVEN SOLID STATE AMORPHIZING TRANFORMATIONS

Amorphization by mechanical alloying: the role of mixtures of intermetallics 73
P. Y. Lee, J. Jang and C. C. Koch (Raleigh, NC, U.S.A.)

Synthesis and process characterization of mechanically alloyed amorphous Ni–Nb powders 85
F. Petzoldt (Bremen, F.R.G.)

Glass-forming ranges of mechanically alloyed powders 93
E. Hellstern, L. Schultz and J. Eckert (Erlangen, F.R.G.)

Synthesis and characterization of mechanically alloyed Ni–Sn powders 99
T. J. Tiainen and R. B. Schwarz (Los Alamos, NM, U.S.A.)

Development of an extremely high energy ball mill for solid state amorphizing transformations 113
H. Kimura, M. Kimura (Yokosuka, Japan) and F. Takada (Tokyo, Japan)

Differences in the amorphization reaction by mechanical alloying of Ni–Zr resulting from different ball-milling techniques 119
A. W. Weeber, W. J. Haag, A. J. H. Wester and H. Bakker (Amsterdam, The Netherlands)

© Elsevier Sequoia/Printed in The Netherlands

RDF and EXAFS structural study of mechanically alloyed $Ni_{50}Ti_{50}$ 129
S. Enzo (Venezia, Italy), L. Schiffini, G. Cocco (Sassari, Italy) and L. Battezzati (Torino, Italy)

High-resolution and *in situ* TEM studies of annealing of Ti–Si multilayers 139
K. Holloway and R. Sinclair (Stanford, CA, U.S.A.)

Deformation-induced amorphization of $CuTi_2$ microcrystals in an amorphous matrix 149
P. D. Askenazy, W. L. Johnson (Pasadena, CA, U.S.A.), E. A. Kamenetzky (Berkeley, CA, U.S.A.) and L. E. Tanner (Livermore, CA, U.S.A.)

Nanometre-sized solids, their structure and properties 161
H. E. Schaefer, R. Wurschum (Stuttgart , F.R.G.), R. Birringer and H. Gleiter (Saarbrucken, F.R.G.)

Calorimetry study of the synthesis of amorphous Ni–Ti alloys by mechanical alloying 171
R. B. Schwarz and R. R. Petrich (Los Alamos, NM, U.S.A.)

Structural modification and ductilization of a metallic glass by mechanical pulverization. 185
H. A. Davies and C. J. Small (Sheffield, U.K.)

3. IRRADIATION DRIVEN SOLID STATE AMORPHIZING TRANSFORMATIONS

Chemical disordering in amorphization 193
D. E. Luzzi and M. Meshii (Evanston, IL, U.S.A.)

Metastable phase formation under irradiation 211
G. Martin and P. Bellon (Vitry-sur-Seine, France)

Radiation-induced collapse of the crystalline structure 219
D. F. Pedraza (Oak Ridge, TN, U.S.A.)

Brillouin scattering and transmission electron microscopy studies of radiation-induced elastic softening, disordering and amorphization of intermetallic compounds 231
P. R. Okamoto, L. E. Rehn, J. Pearson, R. Bhadra and M. Grimsditch (Argonne, IL, U.S.A.)

Computer simulation of defect-induced vitrification. 245
A. Silberstein, P. C. Clapp (Storrs, CT, U.S.A.) and L. E. Tanner (Livermore, CA, U.S.A.)

Modelling of irradiation-induced amorphization in a titanate ceramic 255
W. A. Coghlan and F. W. Clinard, Jr. (Los Alamos, NM, U.S.A.)

Ion beam mixing and radiation-enhanced diffusion in metallic glasses 267
R. S. Averback, H. Hahn (Urbana, IL, U.S.A.) and F.-R. Ding (Argonne, IL, U.S.A.)

Irradiation stability of Pd_2Si 277
M. Nastasi (Los Alamos, NM, U.S.A.), P. R. Okamoto, R. S. Averback (Argonne, IL, U.S.A.), L. S. Hung, J. C. Barbour and J. W. Mayer (Ithaca, NY, U.S.A.)

4. THERMODYNAMICS AND KINETICS OF SOLID STATE AMORPHIZING TRANSFORMATIONS

Metastable phase equilibria and solid state amorphization 287
J. H. Perepezko, Y. A. Chang, H. J. Fecht and M. X. Zhan (Madison, WI, U.S.A.)

Diagrams of formation enthalpies of amorphous alloys in comparison with the crystalline solid solution 299
P. I. Loeff, A. W. Weeber (Amsterdam, The Netherlands) and A. R. Miedema (Eindhoven, The Netherlands)

Thermodynamics of the stability of amorphous alloys of two transition metals 307
R. Coehoorn, G. J. van der Kolk, J. J. van den Broek, T. Minemura and A. R. Miedema (Eindhoven, The Netherlands)

Structure and transformation kinetics in spontaneously vitrified Cr–Ti alloys 317
A. Blatter, J. Gfeller (Bern, Switzerland) and M. von Allmen (Biel, Switzerland)

The thermodynamics of inverse melting 327
A. L. Greer (Cambridge, U.K.)

Thermodynamics of stable and metastable phases in the NiTi system and its application to amorphous phase formation 335
K. Zöltzer and R. Bormann (Göttingen Clausthal, F.R.G.)

Diffusion studies in amorphous NiZr alloys and their relevance for solid state amorphizing reactions 345
H. Hahn, R. S. Averback and H.-M. Shyu (Urbana, IL, U.S.A.)

Differential scanning calorimetry studies of solid state amorphization in multilayer Ni/Zr 353
R. J. Highmore, R. E. Somekh, J. E. Evetts and A. L. Greer (Cambridge, U.K.)

Amorphization of ice Ih by pressure at 77 K 361
E. Whalley (Ottawa, Canada)

Solid state formation of icosahedral phases 375
D. M. Follstaedt and J. A. Knapp (Albuquerque, NM, U.S.A.)

Chemical short-range order in dense random-packed models 385
C. K. Saw (Summit, NJ, U.S.A.) and R. B. Schwarz (Los Alamos, NM, U.S.A.)

AUTHOR INDEX 395

SUBJECT INDEX 397